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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/529,361

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Michel Vaultier

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YOUNG & THOMPSON  
745 SOUTH 23RD STREET  
2ND FLOOR  
ARLINGTON, VA 22202

EXAMINER

KOSLÓW, CAROL M

ART UNIT

PAPER NUMBER

1755

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

03/20/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

Application No.

10/529,361

Applicant(s)

VAULTIER ET AL.

Examiner

C. Melissa Koslow

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 January 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 65-99 is/are pending in the application.
- 4a) Of the above claim(s) 91-97 and 99 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 65-90 and 98 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 November 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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Applicant's election with traverse of Group I, claims 79-89 and 90 in the paper dated 19 January 2007 is acknowledged. The traversal is on the ground(s) that the composition in U.S. patent 4,463,071 is not stable, that it does not mention the use of an ionic liquid as a matrix or as a reaction support. This is not found persuasive because the reference does teach a composition having an ionic liquid matrix and does not undergo spontaneous conversions over time, which applicants has defined as a stable composition. If the composition did not undergo spontaneous conversions over time, then it would not be functional as a battery electrolyte. The claims does not require the reaction support to be an ionic liquid. The claims teach the reaction support is a functionalized ion salt dissolved in the ionic liquid. There has been no showing that aluminum fluoride cannot act as a reaction support. The argued recyclability is not claimed, the discussed methods of making ionic liquids does not show that the reference does not teach or make obvious the claimed composition and use of the composition is immaterial since one only need to show the special technical feature, which is the composition, was taught or obvious at the time of invention.

The requirement is still deemed proper and is therefore made FINAL.

Claims 91-97 and 99 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement.

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 65-78 and 90 are rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a

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process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

These claims do not set forth any active or positive steps of any organic synthesis process using a composition comprising a functionalized ionic salt dissolved in an ionic liquid. The claims simply state how make a composition comprising a functionalized ionic salt dissolved in an ionic liquid

The Examiner agrees claims 65 and 90 set form method steps teaching how to make the composition, but they do not set forth any active or positive steps for any organic synthesis process, which is what is being claimed. The fact the organic synthesis is continuous, discontinuous, combinatorial, parallel and/or for preparing libraries of products does not give any specific steps of any synthesis process. The rejection over claims 65-78 and 90 is maintained.

The disclosure is objected to because of the following informalities:

Pages 6 and 13 teach  $Y^-$  -F is selected from the anions F, OH, CN, RO and RS, but there is no F group, as defined by the specification, in these ions, they are only  $Y^-$  ionic entities. The specification teaches the functionalized salt is dissolved in the ionic liquid, which means it dissociates into a cation and anion; but then it teaches the functional group is the one that reacts in the organic processes. It is unclear why it is the functional group and not the ions that react. In addition, the specification teaches the functionalized salt is an ionic liquid, but the given functionalized ionic liquids would not dissolve in the matrix ionic liquid. They would be miscible with the matrix liquid. Applicants need to clarify this. Appropriate correction is required.

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Claims 65-80, 85-89, 90 and 98 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 65-78 and 90 provide for the use of the composition of claim 79, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claims 65-78 and 90 do not set forth any active or positive steps of any organic synthesis process utilizing a composition comprising a functionalized ionic salt dissolved in an ionic liquid. The claims simply state how make a composition comprising a functionalized ionic salt dissolved in an ionic liquid.

Claims 79 and 98 teach  $Y^-$ -F is selected from the anions F, OH, CN, RO and RS, but there is no F group, as defined by the specification, in these ions, they are only  $Y^-$  ionic entities. Thus they are indefinite. In addition, there claims teach a salt dissolved in the matrix, thus it is unclear if it is still in the form of a salt or if the matrix contains ions of the salt which are not bonded together.

Claims 85-89 and 98 teach the salt is an ionic liquid. The claimed functionalized ionic liquids would not dissolve in the matrix ionic liquid. They would be miscible with the matrix liquid. Thus these claims are indefinite.

Claim 80 is indefinite since it is unclear what is the first and second part of the ionic liquid. The claim teaches either the cation and/or anion of the ionic liquid  $A_1X_2$  is functionalized, but this counters applicants' definitions of  $A_1$  and  $X_2$  which states that these ions are not

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functionalized. It should be noted that if the composition is made up of two different functionalized ionic liquids, it will be restricted out since it does not contain the special technical feature composition as defined in claim 79.

Claim 89 is indefinite since the definition of  $X_2$  of OH, CN and F do not allow for the presence of the anionic entity Y, as discussed above, and does not match that of claim 79, when is it not OH, CN or F. Claim 79 teaches  $X_2$  is OH, F, CN, RO, RS or has the formula  $Y^-(L)-F$ , where L is an alkyl groups with 1-20 carbon atoms, Y is an anionic entity and F is one of the listed functional groups. The claimed anions  $N_3$ ,  $R_cBZ_3$  and  $WCR_cV$  are not found in the list of accepted  $X_2$  ions given in claim 79.

With respect to the rejection over claims 65-78 and 90, the Examiner agrees claims 65 and 90 set forth method steps teaching how to make the composition, but they do not set forth any active or positive steps for any organic synthesis process.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 79 and 82 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent 4,463,071.

This reference teaches a composition comprising an ionic liquid matrix and aluminum halide, such as aluminum fluoride, where the liquid and the salt do not react with each other. The reference suggests the claimed composition.

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Applicants argue the taught composition is not stable, but it meets applicants definition of stable given on page 6 of the specification, which is it does not undergo spontaneous conversions over time. If the composition did not undergo spontaneous conversions over time, then it would not be functional as a battery electrolyte. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., stability in air and water and recyclability) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). The rejected claims does not require the reaction support to be a ionic liquid, as argued. The claims teach the reaction support is a functionalized ion salt dissolved in the ionic liquid. Page 14 of the specification teaches halides can be functional salt in the taught composition. The discussion with respect to chloroaluminate ionic liquid is noted, but the reference does not teach the ionic liquid or the salt is a chloroaluminate. Finally, applicants have not shown that the taught aluminum fluoride can not act as a soluble reaction support.

Claims 79, 81-88 and 98 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent application publication 2002/0010291.

This reference teaches a mixture of a functionalized ionic liquid combined with a non-functionalized ionic liquid (para. [0054]). This teaching suggests any combination of these liquids, which allows for mixtures where the non-functionalized ionic liquid acts as the matrix and the functionalized ionic liquid is dissolved therein. The reference teaches the non-functionalized liquid can be any known ionic liquid, which includes of claims 85, 87 and 98. The functionalized ionic liquid is one where the anion is one of those claimed in claims 85, 88 and 98

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and the cation is functionalized, such as a pyridinium or an ammonium, where the functional group is a halogen, SCN, CN, OH, OR, OCOR, COOR and O<sub>2</sub>SR, where R is an alkyl group with 1-20 carbon atoms, and it is linked to the cation by an alkyl group having 1-50 carbon atoms. The reference encompasses composition where the anions of both liquid can be same. There is no indication that functionalized and nonfunctionalized liquids react with each other nor that they can be extracted from each other by solvent extraction. The reference suggests the claimed composition.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melissa Koslow whose telephone number is (571) 272-1371. The examiner can normally be reached on Monday-Friday from 8:00 AM to 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo, can be reached at (571) 272-1233.

The fax number for all official communications is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

cmk  
March 16, 2007

  
C. Melissa Koslow  
Primary Examiner  
Tech. Center 1700